

Flight, May 7, 1910.

FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

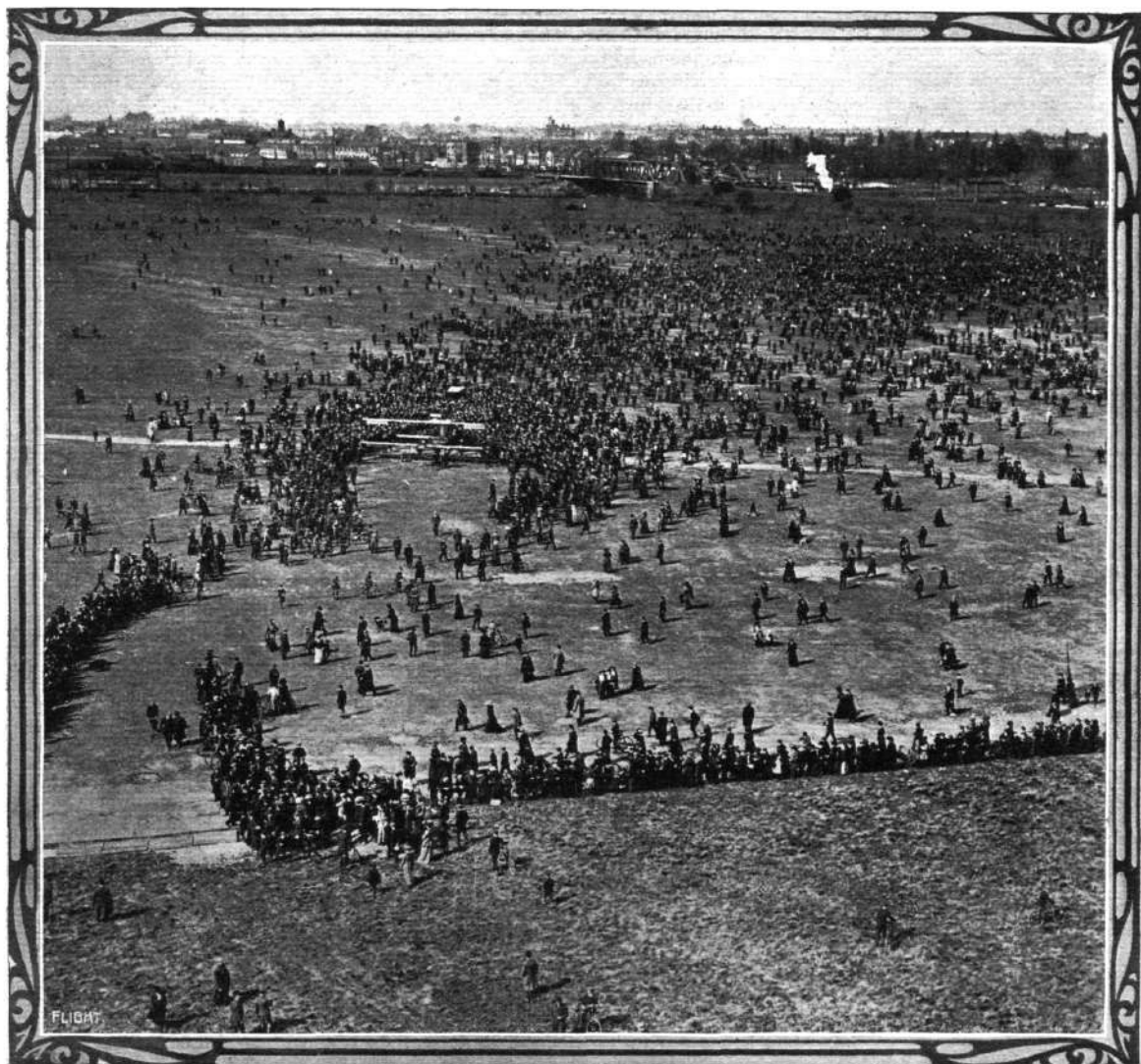
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MAY 7, 1910.

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THE GREAT LONDON-MANCHESTER FLIGHT.—Remarkable photograph of the scene on Wormwood Scrubs on Wednesday, April 27th, when Mr. Grahame-White's Henry Farman machine was brought out for a few trial tests after the repairs had been completed.

LONDON TO MANCHESTER, AND AFTER.

Now that the great flight to Manchester has been accomplished, and the event has receded somewhat into the realms of past history, it is possible to get a truer perspective and arrive at conclusions with a much more open mind than could have been the case when the event was yet almost the sole topic of conversation during the latter half of last week. Then, although the whole nation was applauding the successful issue of Paulhan's plucky enterprise, there was a natural feeling almost of humiliation that a foreigner had hurried over to our shores and done at the first time of asking something that our own representative had tried and failed at. Even now we are not sure that that feeling of humiliation can be satisfactorily explained away. In the abstract we can see much cause for searchings of heart in the one salient fact that Great Britain has once more failed to act up to its past history and take the lead in a matter which so vitally concerns the world's scientific progress as aviation. We, who for many decades were the mentors of the nations in all that made for the development of civilisation and progress in science, art and commerce, have, say the pessimists, fallen from our high estate, and are now content to sit at the feet of our rivals and assimilate the knowledge which springs from their enterprise and invention. There may or may not be much in this—perhaps there is, but it is not to be expected that the schoolmaster will remain for ever superior in every branch of knowledge to all his pupils, or that those pupils will never evolve anything at all from their own initiative. The most he can expect is to remain superior to them in the sum total of knowledge and experience, and it would be a bold man who would proceed to prove that we are not even yet premier among the nations in that respect. If that is so, although it is not good for our *amour propre* to be badly beaten, it need not be taken as a sign of national decadence.

As a plain matter of fact, we have plenty to congratulate ourselves upon, even though the representative of our friends across the Channel has handsomely beaten our own man and taken the plum of all the flight prizes away from us just when it seemed most likely to remain here. We most heartily congratulate M. Paulhan and France upon having secured the prize, and we freely accord them all possible honour for a magnificent achievement. Indeed, we will go much farther than that and assert that it was best and fairest that the event should have concluded as it did. We shall not be accused of undue bias when, to point our argument, we say that in the case of the cross-Channel flight it was far more fitting for M. Blériot to have achieved the distinction of being the first to cross, than it would have been had Latham succeeded in his first attempt. In the one case, the man had been experimenting for many months with the object of developing a practical machine. At the eleventh hour, so to speak, another competitor—not himself a designer—appeared on the scene, almost on the spur of the moment, to fail, and made room for the man who had been working quietly and steadily towards his end since long before the bare idea occurred to the other. To a little less extent the same argument applies in the case of the London-Manchester flight; and again we say that, reviewing all the circumstances, Paulhan had—if we may be allowed to put it in that way—the greater right to win the prize. Not that we should not have been far better pleased had Mr. Grahame-

White's plucky attempts been crowned with success. It goes without saying that we had rather have seen him or any other of our British aviators win this most important contest; and nothing in the manner of M. Paulhan's success can be advanced in detraction of what we said last week regarding Mr. Grahame-White's brilliant attempt, and subsequent sportsmanlike behaviour that has rightly raised a perfect wave of appreciation throughout the civilised world. The fates have ruled that things should be as they are, and there is no reason why the friends of British aviation should not be quite well pleased that things have been ordered thus—particularly if a ready response to the Grahame-White testimonial instituted by the Royal Aero Club indicates that British pluck will ever receive due recognition at home.

Now, with regard to some other aspects of this the most important of all aerial events and its influence upon the future of aviation. While we do not hold any brief for the *Daily Mail*—so far as our observation goes, it is quite capable of conducting its own case—we must put it on record that Lord Northcliffe and those associated with him are treating aviation and its development in rather more than a liberal spirit; they are treating it in an eminently broad and even statesmanlike way. A prize, the most important ever offered by any journal or private person to any modern sport or science, has been won; and after the nine days' wonder has had time to subside, the natural thing to occur is a marked reaction of feeling, not only among the public, whose wonder and admiration of an extraordinary feat has been manifested in a manner almost foreign to the national characteristics, but among the actual participants in the movement as well. With this undoubtedly in mind, and with a desire to maintain and stimulate interest and development which is beyond all praise, the *Daily Mail* now comes forward with a further £10,000.

And another point in which we see something which is admirable is that conditions are to be imposed that are by no means impossible or even remote of realisation, but are yet sufficiently onerous to make it a matter of certainty that our present-day knowledge must be vastly improved before the prize can be won. What the exact conditions, which will be laid down for the guidance of competitors for the new *Daily Mail* prize are likely to be we cannot for the moment say, though we refer to the matter in a separate article on another page, and also put forward in brief an idea of our own. Nothing has been definitely settled yet, though the details are now being actively discussed, and the suggestions of experts courted, so that a definite pronouncement may be expected almost at once.

Before we leave the subject of this last great flight and its aftermath, we feel that a word of praise is due to the many who by their whole-hearted assistance made the achievement itself possible. Motorists volunteered their services, the L. and N.W. Railway Co. did all and more than could have been expected of them; in fact, everyone who could be of the slightest use was only too willing to incur trouble and in many cases expense to help along the new movement. The whole thing has been by way of a revelation to many who had begun to think that aviation was regarded in Great Britain with something approaching indifference. And the whole thing, too, has resulted in multiplying a thousand-fold the belief of the public in the new era that is now rapidly opening up.

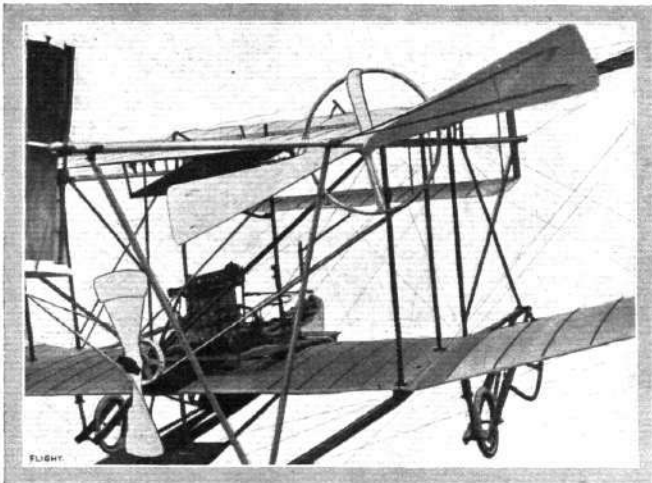
THE MAXIM BIPLANE.

(Concluded from page 325.)

Three Propellers.

ONE of the most important features of the machine is the system of using three propellers. Two of the propellers are mounted on the main spars of the frame, while the third, which is much smaller in diameter, is direct driven by the engine. The larger screws revolve in opposite directions, and are driven by ropes. The right-hand screw, viewed from behind, rotates in the same direction as the central screw; the other propeller,

intended thereby to minimise as far as possible the loss caused by their rotation through the air. It will be observed, on re-

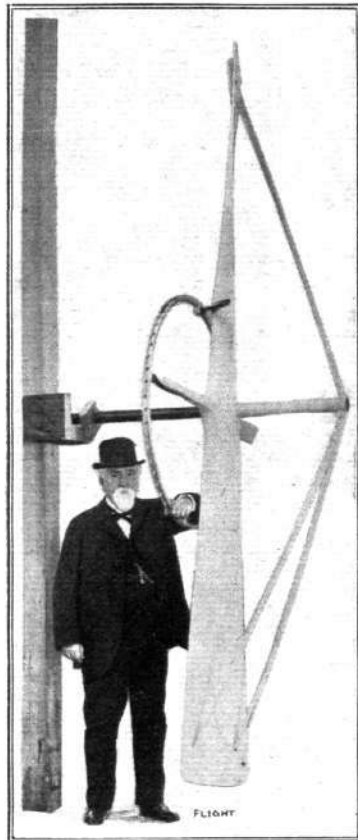


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View illustrating the rope drive to the propellers on the Maxim biplane.

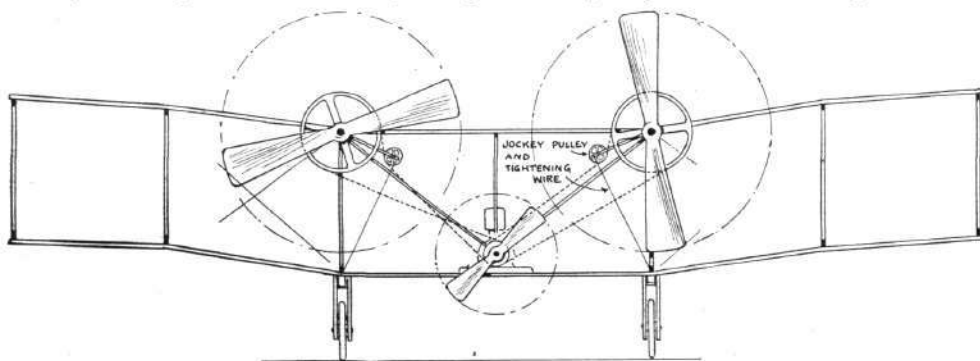
which has a reverse direction of rotation, has therefore, a finer pitch and a higher velocity than its mate in order to compensate for the gyroscopic effect of the central screw. The propellers are two-bladed, and exceedingly thin and light for their size; in fact, the blades are so thin that they would bend if unsupported, and they have, therefore, been trussed by strip steel ties, which anchor their extremities to a tubular extension of the boss. These strips of steel are so arranged that their surfaces have approximately the same pitch as the screw itself, it being

ference to one of our photographs, which shows a propeller separately, that the tubular extension at the boss affords a remarkably long



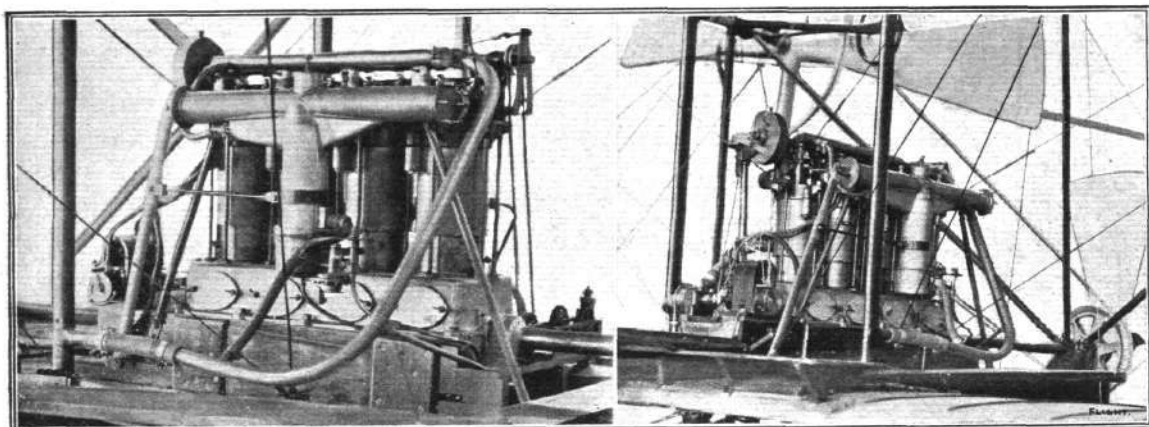
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Photograph of one of the propellers for the Maxim biplane, with Sir Hiram Maxim standing alongside, which gives some idea of the size of these screws. The trussing of the very thin blades to the tubular sleeve is a special feature of the design.



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Sketch illustrating the arrangement of the jockey-pulleys, which are used to tighten the rope drive of the propellers on the Maxim biplane.



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Views of the Maxim engine on the Maxim biplane. The cylinders are made of steel, and have detachable German silver water-jackets. The vertical water-pipe on the extreme left forms a main strut in the framework of the machine.

bearing surface for the support of the propeller upon its shaft.

The pulley for driving the propeller is fastened direct to the blades by steel brackets and also similarly to a pair of wooden stumps that project from the boss at right angles to the blades. It is thus supported at four points. The groove in which the rope runs is coggled to give an effective grip.

The Rope Drive.

The rope drive of the propellers is an interesting and original feature of the Maxim system, and much care has

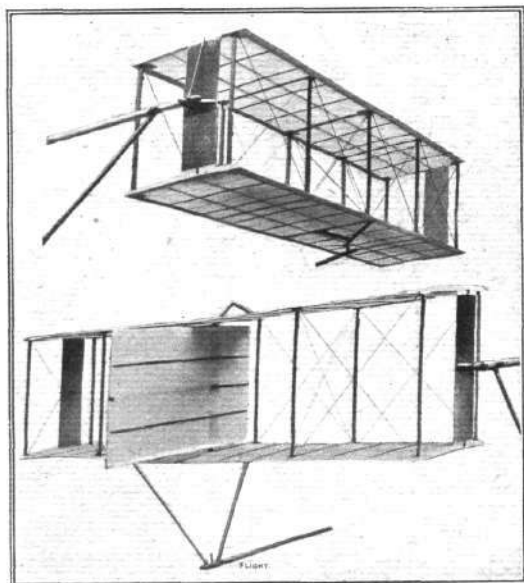
been taken in the construction of the ropes, which are woven on a special machine designed and erected at the Crayford works. The ropes are endless and are made of a very fine tough thread, such as is used by bootmakers for certain purposes in connection with their trade. The adjustment of the rope is effected by jockey pulleys, and the surface of the rope is prepared with the best quality beeswax.

A very important consideration to be borne in mind regarding the arrangement of the three propellers on the Maxim biplane is their disposition in respect to the principal masses represented by the various members of the machine itself. It will be observed, for instance,



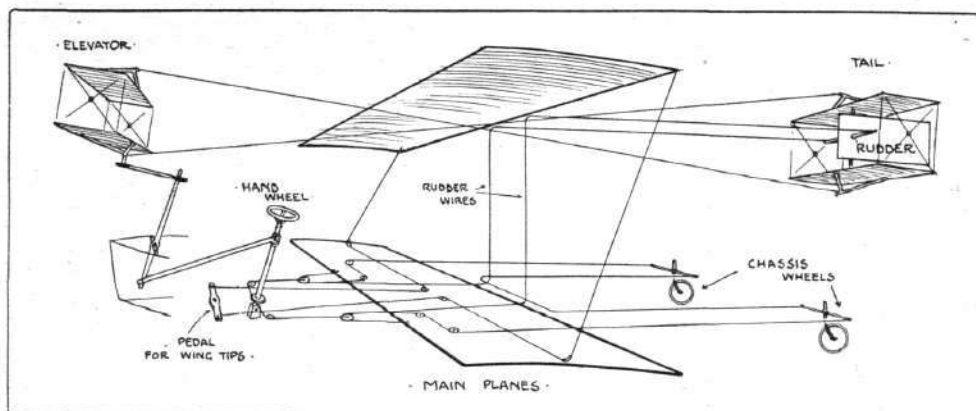
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Photograph illustrating the arrangement of seats on the Maxim biplane. On the left is T. Jackson, who assisted Sir Hiram Maxim in the construction of his original machine, and was a passenger thereon during its accidental free flight in Baldwyn's Park.



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Views of the elevator and tail on the Maxim biplane. The tail, which carries the rudder, acts in unison with the elevator.



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Diagrammatic sketch illustrating the connections in the control of the Maxim biplane. The elevator and tail work in unison, being interconnected by cross wires. The chassis wheels and the rudder also work in unison. The main planes are warped by a pedal.

that the pilot, the engine, and the central screw are arranged in tandem; in fact, the central screw has been provided solely in order to recover some of the energy from the wake of this mass. This is a particularly interesting point, because the value of the wake is by no means accepted as an appreciable quantity by the majority of flight engineers, and this very definite verdict on the part of Sir Hiram Maxim should at least bring the matter into prominence.

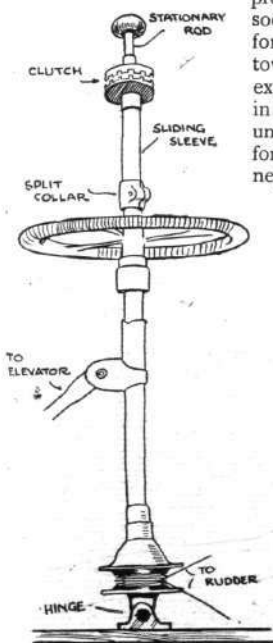
No marine engineer would ever think of putting a screw in front of a ship; indeed it can be theoretically proved that with any wake whatsoever a boat can be propelled for less power than it can be towed. Deductions from water experiments do not apply to air in the same degree, but they undoubtedly afford useful information that should not be neglected. At the present time constructional considerations have more to do with locating the position of a propeller on a flying machine than

anything else, but engineering fails to accomplish its purpose if constructional difficulties are allowed to limit design in such matters of fundamental importance. Whether others will think it worth while to follow Sir Hiram Maxim's example of providing an additional propeller to work in the wake of the principal mass, naturally very much depends on the success of this particular machine.

The Engine.

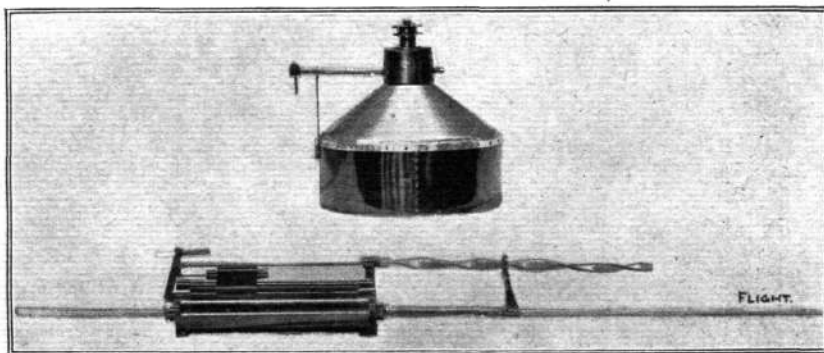
The engine on the Maxim biplane, like the machine itself, has been designed by Sir Hiram Maxim. It has four separate steel cylinders with detachable heads and water-jackets; the former being made of steel, and the latter of German silver. Long steel bolts passing into the crank-chamber hold the cylinder-heads in place. The valves are all overhead, and are operated by an overhead cam-shaft, which is skew-gear driven from the crank-shaft.

A belt from the rear end of the cam-shaft drives a clockwork mechanism employed for operating the lubricating system. The oil reservoir contains a spring-loaded plunger-pump, which is raised and liberated four times a minute. The force of the pump exerts a pressure of about 120 lbs. per sq. in. on the oil, and



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Sketch illustrating the steering-wheel and elevator-lever on the Maxim biplane.



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View of the gyroscopic control mechanism constructed for attachment to the Maxim biplane after the preliminary tests.

delivers a momentary stream under this high pressure to all the principal bearings.

A transverse skew-gear driven shaft in front of the engine drives the magneto and the water-pump. The cylinder-heads are water cooled as well as the walls, and the cooling water passes through a radiator mounted on the upper deck of the main-planes. One of the hollow steel struts that support the upper deck is employed to convey the water to the radiator.

The carburettor on the Maxim engine is very noticeable on account of its large size, and it is also of somewhat peculiar construction, being mainly remarkable for the very large capacity of the mixing-chamber that contains the throttle-valve. The object of this chamber is to thoroughly mix the gas in large quantities before it is admitted to the cylinders. Part of the mixing-chamber is warmed by an arrangement of water pipes.

The Control.

The control of the Maxim biplane involves the manipulation of the elevator, tail, and rudder, and also the warping of the wings. These operations are effected by a steering wheel riding upon a pivoted lever, and by a pivoted cross-bar under foot control. The interconnections are shown diagrammatically in an accompanying sketch. The elevator and the tail are interconnected by cross wires so that they work in unison, and the elevator is directly connected to the pivoted lever by a system of links, so as to be operated by a to-and-fro movement of the lever. The rudder, which is carried by the tail, is operated by a rotary motion of the steering wheel upon the pivoted lever as an axis. The warping of the planes is accomplished by means of the pedal. A feature of the warping system is that the planes are warped in one direction by the wires, and in the other direction by springs.

A minor detail in the control mechanism to which it is necessary to draw attention is the method of mounting the steering wheel upon the pivoted lever. The steering wheel is mounted on a sleeve fitted with a jaw-clutch that engages with a corresponding member on the rod. The rudder is thus locked in any desired position by this device, and it is necessary to force the steering wheel downwards against the action of a spring in order to rotate it. There is also a split collar on the steering wheel sleeve into which a handle bar can be screwed if the pilot prefers such a device to a steering wheel. Some of our photographs show the machine with the handle bar in place. It is made in halves and the split collar is automatically

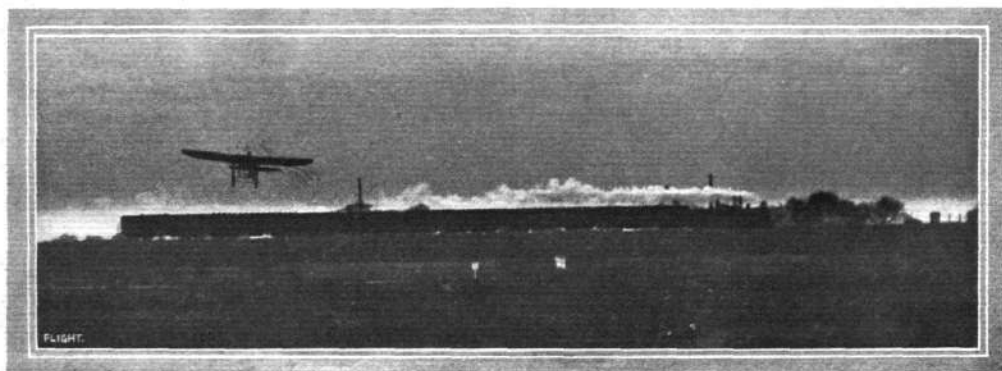


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General view of the aerodrome at Crayford where the Maxim biplane is to be tested on a circular track by running it on a lead attached to the wind tower in the centre.

clipped in place by screwing the halves of the handle bar together.

It is Sir Hiram Maxim's intention, when the preliminary experiments have been brought to a satisfactory conclusion, to fit gyroscopic control. The gyroscopic mechanism has already been constructed for this purpose. The gyroscope, which consists of a spinning fly-wheel, is contained in a cylindrical casing, and it is designed to operate, through a relay mechanism, a cylinder containing a piston to which an operating rod is attached. Some very ingenious mechanical details have been introduced in the construction of this piece of apparatus.



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Mr. James Radley flying at Brooklands Aviation Grounds at dusk on Wednesday of last week over one of the London and South-Western trains

A NEW PRINCIPLE IN THE CONSTRUCTION OF STATOSCOPES.*

By L. LUZERN CUSTER.

To know whether one is ascending or descending; to know how fast one is ascending or descending; to know definitely the altitude; these are matters of paramount importance in the management of every kind of air craft.

To determine the state of vertical motion of a balloon—whether rising or falling—an instrument termed a statoscope is employed, and to tell its altitude an aneroid barometer is used. The statoscope is to show whether you are in the act of rising or falling, and has no reference to degree of altitude. It is with this instrument that this paper shall deal.

Historically, the first statoscope of which we have record was a mercury column used by Pascal in endeavouring to prove Torricelli's theory of the existence of a vacuum. He found that by ascending Mount Puy de Dome the mercury in the mercury tube fell 3 in. From that time to this the fundamental principle upon which nearly all statoscopes have been constructed has remained the same.

It is known that the pressure of the air existing at various altitudes above the surface of the earth varies.

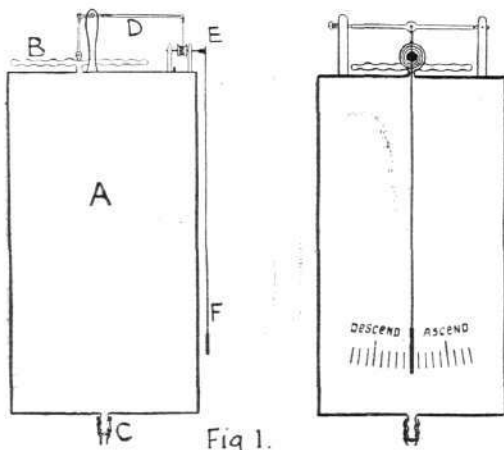
For the benefit of those who are not as well versed concerning the physics of the atmosphere as are others, the following explanation is given. In the first place, as is well known, the earth is surrounded by a layer of air. This air, or the atmosphere, in accordance with the laws of physics concerning gases, varies in its density. This is due to the weight of the superimposed air over any area at any level. As the level of this point is raised, the super-

motion of the recording needle to a comparatively great ascent or descent; and, third, the inconvenience of pressing the rubber tube every time a reading is taken.

It was to overcome these apparent defects that I set about to construct a statoscope by which I hoped to overcome these patent faults.

The statoscope (Fig. 2) I have to introduce is based on the difference of atmospheric pressure existing between any two different levels, thus far similar to those already constructed. From this on it is radically different, as you will observe. Instead of using a delicate metal diaphragm, and a complicated clockwork device, I employ a large capillary tube, with an internal bore of about $\frac{1}{8}$ of an inch, containing a globule of oil—coal oil or other liquid of light specific gravity and viscosity. This tube is connected to the reservoir at one end, and finds exit to the outside air at the other. Any difference of pressure between the enclosed air and the external air will be quickly detected by a movement of the globule one way or the other. It can be readily seen that there is no lost motion in the action of the globule at the critical time. The very instant there is the least change of pressure, the globule moves, and no unsteady motion occurs as in other statoscopes. This use of a globule of oil instead of a clockwork mechanism has the added advantage of being almost frictionless.

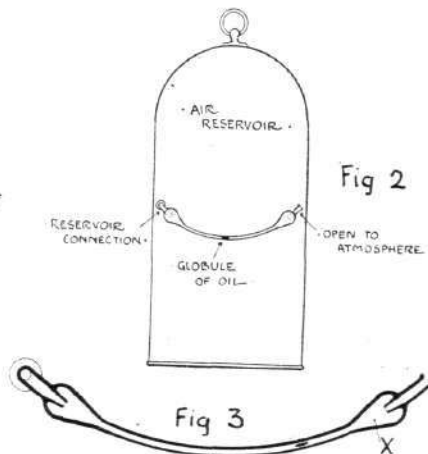
In this design there is no tube connecting the interior of the reservoir to the external air, and it must therefore create a constant



imposed air becomes less, and the pressure consequently diminishes; if it is lowered the pressure increases—thus we find there is a definite air pressure for a definite altitude.

The statoscope (Fig. 1) as universally used at present consists of a closed reservoir, A, connected to an extremely sensitive metal diaphragm, B, which is exposed on the outside to changes of atmospheric pressure. An open tube, C, also enters this reservoir, thus normally maintaining a pressure within equal to that without. Closing this tube, and holding the statoscope quiet, the pressures within and without still remain equal, and so no motion of the metal diaphragm takes place. But suppose we elevate the statoscope with the tube closed, then what will result? The confined air now being of greater pressure than the surrounding air, the diaphragm is pushed out. Now, if instead of elevating the instrument we lower it, a reverse operation will consequently ensue; the pressure on the outside now being greater, the diaphragm is compressed. These movements, although exceedingly slight, are recorded by means of suitable levers, D, clockwork, E, and a long delicate index needle, F. When in either case the needle reaches the limit of the scale, it can be again reset by releasing the pressure on the tube, thus permitting an equalisation of pressure within and without.

From my observations of the operation of a statoscope of this style, I perceive three notable defects. First, a jerky motion when the index needle is on the verge of noting an ascent or descent, and this is unfortunately at a critical time. Second, the small range of



motion of the globule in one direction or the other. As it is a mechanical impossibility to have a tube long enough to register such a motion as would be produced in ascending or descending, say, a mile, this must be provided for by some other expedient. This has been accomplished in the following manner. Each end of the tube is drawn out in a long narrow taper, thus forming a means by which the globule may be broken when it reaches this point of the tube. The oil then flows back until by capillary attraction it bridges over and a new seal is formed. This motion is consequently continuous—the globule always moving in one direction in ascending and the opposite in descending. The rate at which the globule moves will also be an index of the relative rate of vertical motion of the air craft.

As will be observed by reference to Fig. 3, the tube containing the globule of oil has a very slight curve. This is done to counteract the action of gravity as far as possible, thus allowing the globule to be considerably more sensitive than if the tube were in a vertical position, as is the tube in a barometer.

The trap, X, in the same figure is merely a mechanical contrivance to permit of holding the statoscope in any position without the loss of oil and yet allow air to pass through.

Now, regarding the range of motion: By actual comparison between a standard statoscope and one of this form, I find that with air chambers of the same cubical contents, the ratio of movement to a given height of 50 ft. is 1 in. in the ordinary statoscope to 8 in. in this form. In other words, with the same cubical contents, this is approximately eight times as sensitive. As the range of motion

* Read before the International Aeroplane Club, Dayton, O.

of the globe varies directly as the cubical contents of the air chamber, it is seen that the range of motion or delicacy of the instrument is infinite. The larger the air chamber, the greater the motion of the globe.

This constitutes in the main the statoscope I have constructed.

Some of the advantages which I claim for this appliance are, first, its simplicity and consequent cheapness of manufacture; second, the

delicacy of its operation; third, the absence of moving parts and frail mechanism; and, lastly, the elimination of the inconvenient rubber tube necessary in other statoscopes.

As to its application, I feel that a statoscope of this kind could not only be used in balloons and lighter-than-air vessels, but would be applicable to aeroplane work as well.

It is with the hope that this instrument may be of some value in aerial navigation that I respectfully submit this to you.

WORLD'S RECORD FOR SEA FLYING.

A FINE world's record was put up by the Hon. C. S. Rolls with his splendid flights over the sea at the Nice Meeting. He flew 120'6 kiloms. in this way, of which 77'23 kiloms. was in one day and 51'49 kiloms. in one continuous flight over the sea.

Mr. Rolls' machine only started on the fourth day of the meeting, and thus started with a big handicap against the other aviators. Moreover, his engine was only about half the horse-power of the other successful competitors; the wins recorded in his favour given below are therefore the more gratifying for our British representative.

World's record for sea flying.—120'6 kiloms., of which 77'23

kiloms. was in one day and 51'49 kiloms. in one continuous flight over the sea.

"Prime Croisiere."—Nice-Cap Ferrat and back (effected twice).
"Prime Croisiere."—Nice-Cap d'Antibes and back (effected three times).

Second prize.—Four fastest circuits, April 21st.

Second prize.—Sea race Nice to Garoupe Lighthouse (Prix de la Ville d'Antibes).

Third place in height competitions.

Fourth prize (4,000 frs.) for total distance flown during the meeting.

MR. CECIL GRACE'S FINE FLIGHT AT EASTCHURCH.

At 10.37 a.m. on Saturday Mr. C. S. Grace left the rail on the Eastchurch flying ground and headed direct for Sheerness, but finding the wind too puffy over the hills he turned southward over the flats and circled until he attained an altitude of about 700 ft., then headed again for Sheerness over the hills, rising steadily all the time and crossing the town at an altitude of 1,100 ft. Still rising, he continued his flight out over the harbour and ships and crossed the Isle of Grain.

Making a wide turn, he recrossed Sheerness at a height of 1,500 ft. His speed was now very great, for the wind was so strong that at times, when flying against it, he was not travelling more than 6 or 7 miles an hour, which would make it over 35 miles an hour at that height.

Whilst over Sheerness he dropped a packet containing some letters, with a request thereon to the finder to post, and they have since all been delivered.

On the return journey, when within about one mile of his starting

point, and at an altitude of between 1,000 and 1,100 ft., his engine gave signs of trouble, so that he decided to switch off and glide to the ground. But on nearing the ground he was in doubt as to being able to clear a row of trees which bound the Royal Aero Club ground on the western end of the field, so he turned the machine completely around, headed into the wind and away from the trees, and landed in the field adjoining the ground without damage to the machine.

The duration of flight was 46 mins., while the wind, which was W. by N., blew about 18 m.p.h. on the ground.

On Sunday Mr. C. S. Grace did not go up until 3.2 p.m., when, after a short turn around the ground, he headed for Sittingbourne on the mainland, and passing over it, turned east and passed around the tall chimney of the works situated about one mile east of that town. Then he flew back to the flying ground, and landed after a high glide at 3.18 p.m. Later he made a short flight.



THE GREAT LONDON-MANCHESTER FLIGHT.—Mons. Louis Paulhan at Manchester after his historical achievement. Reading from left to right: Madame de Kersansan, Mr. Henry Farman, Madame Paulhan, Mons. Paulhan, Mons. de Kersansan, and Mr. Holt Thomas.

MAY 7, 1910.

FLIGHT

THE GREAT LONDON-MANCHESTER

£10,000 FLIGHT.



THE GREAT LONDON-MANCHESTER FLIGHT.—General view of the scene on Wormwood Scrubbs prior to Mr. Grahame-White's start for his second attempt on April 27th. Bringing the Henry Farman machine out for the flight.



THE GREAT LONDON-MANCHESTER FLIGHT.—Mr. Claude Grahame-White at Polesworth, where he came down after his night flight on Thursday morning, April 28th, calling for three cheers for Mons. Paulhan upon the receipt of the news of his having won the £10,000 prize.

LONDON TO MANCHESTER.

£10,000 MORE FOR PRIZES.

IN our last issue we were able to give details regarding the actual flight for the £10,000 prize offered by the *Daily Mail* for a flight from London to Manchester. Following the winning of the prize, and the formal announcement by the Royal Aero Club that the rules had been complied with, the successful aviator has had to endure one continuous round of festivities and congratulations, and in these, the honour accorded to Mr. Claude Grahame-White, who made such a plucky attempt to win the prize for Great Britain, was only second to that rendered to Paulhan himself. On Saturday both aviators were entertained at a déjeuner given by the *Daily Mail* at the Savoy Hotel, at which Mr. Thomas Marlowe, Editor of the *Daily Mail*, presided, in the absence, through indisposition, of Lord Northcliffe, and among those present besides M. and Mme. Paulhan, Mr. Claude Grahame-White and his mother and sister, were the French Ambassador, M. Cambon, the Duke of Argyll, Lord Blyth, Lord Kinnaird, Lord Suffield, Lord and Lady Llangattock, Lord Lonsdale, Lord Hardwicke, Baron de Forest, the Comte de Lastours, Sir Rufus Isaacs, Sir Edward Carson, Sir James Crichton Browne, Sir William Bailey, Sir David Gill, Sir Edward Henry, Sir George Lewis, Sir Norman Lockyer, Sir Hiram Maxim, Sir Horace Regnart, Sir James S. Winter, Admiral Sir E. Seymour, Admiral Sir Edmund Fremantle, Major Baden-Powell, Mr. Roger Wallace (Chairman of the Royal Aero Club), Mr. Moore-Brabazon, Mr. Holt Thomas, Mr. Charles Nicholson, M.P., Mr. Sheriff Slazenger, the Hon. C. S. Rolls, and Mr. H. Perrin.

After the toast of "The King and the President of the French Republic" had been honoured, the Chairman, after expressing the regret that Lord Northcliffe was not present in person to hand over the prize, the idea of which he conceived after seeing Mr. Farman fly in 1906, went on to say that Lord Northcliffe authorised him to announce that the *Daily Mail* would offer another £10,000 for aviation.

Although the conditions could not be then made public, it was suggested that it might be given for a flight from London to Edinburgh and back, and in like manner to Paris. He then asked M. Cambon to present the prize, which took the form of a cheque enclosed in a gold casket.

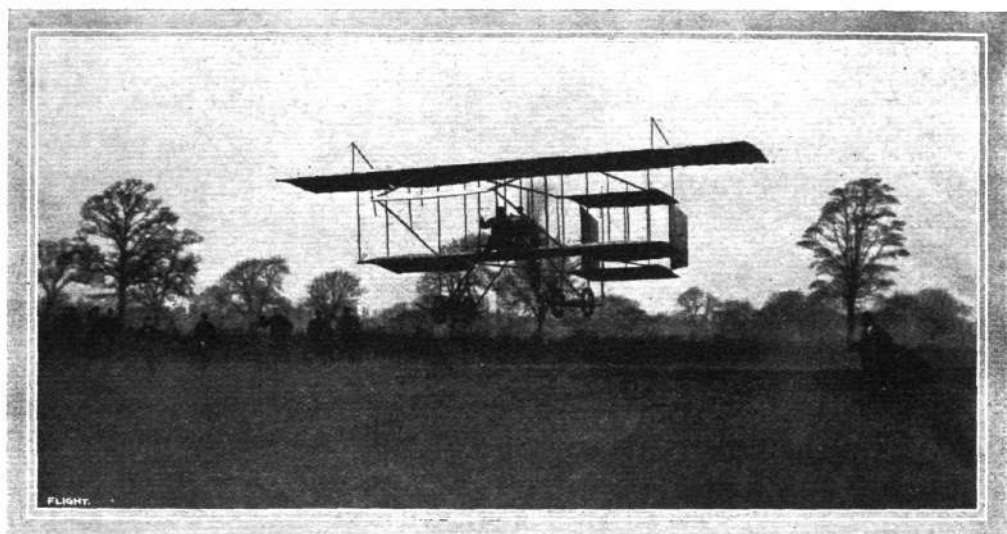
After referring to the fact that only last year he assisted at a similar function given in honour of another compatriot, M. Biériot, and that they had the right to feel proud of France, M. Cambon went on to point out how proud Britain should be of Mr. Grahame-White, and to applaud the good feeling which never ceased to exist between the two rivals. In a modest speech in French M. Paulhan acknowledged the gift, and emphasised how much these large prizes did to forward the cause of aviation. He was proud to have won the prize, because it had been so difficult



Unique memento of the London-Manchester flight for £10,000 published by the *Weekly Despatch*.—The autographs on the menu card of the Paulhan Banquet at the Savoy Hotel when the £10,000 cheque was presented to the victor are M. Paulhan, Mr. Grahame-White, Mme. Paulhan, Mrs. Grahame-White, Miss Grahame-White, the Duke of Argyll (President Royal Aero Club), Mr. T. Marlowe (Editor of the *Daily Mail*), representing Lord Northcliffe).



THE GREAT LONDON-MANCHESTER FLIGHT.—Flashlight photograph at Lichfield of Paulhan's Henry Farman machine before his start for finishing the race on Wednesday morning, April 27th.



THE GREAT LONDON-MANCHESTER FLIGHT.—M. Paulhan winning the £10,000 prize by landing in the pre-arranged field at Didsbury, near Manchester, on his Henry Farman machine.

to win, and he was proud of having such a courageous rival as Mr. Grahame-White.

The Chairman then presented a large and handsome silver cup to Mr. Grahame-White as a slight token of admiration of the gallant efforts he had made to win the prize for Great Britain. In his speech acknowledging the gift, Mr. Grahame-White referred to the many difficulties both he and Paulhan had met with in the course of their flight, and said he hoped to make a non-stop flight from London to Manchester before long. With regard to the testimonial which was being got up by the Royal Aero Club, he proposed to devote the money to the organisation of a flight from London to Paris.

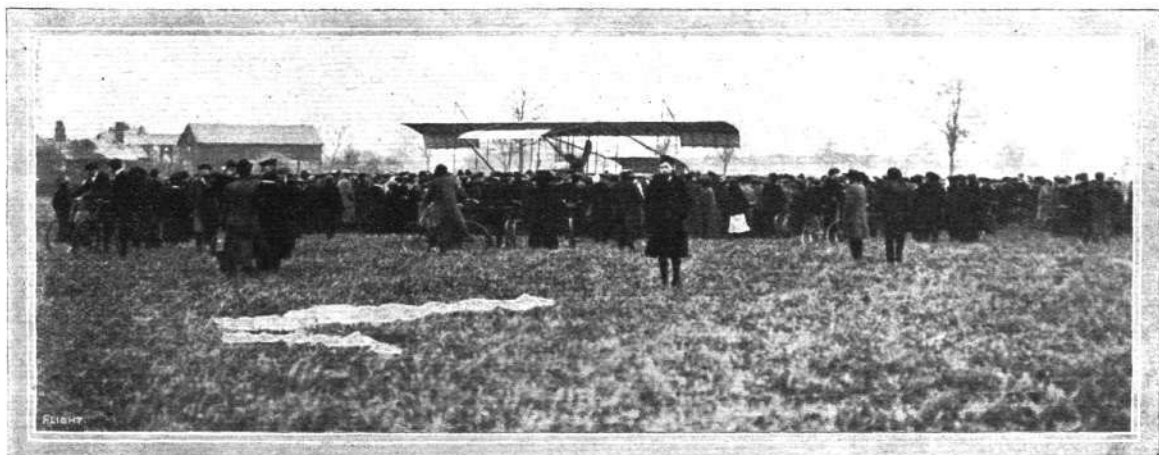
After the luncheon, M. and Mme. Paulhan immediately left for France, and among those at the station to see them off were Mr. Claude Grahame-White, Mrs. Grahame-White, Miss Grahame-White, Mr. Harold Perrin, secretary of the Royal Aero Club, and several prominent British flying men, while a huge crowd gathered in and around the station. After the boat train had left, the attention of the crowd was given to Mr. Grahame-White, who was loudly cheered.

The Official Observers.

IN view of the historic value of the great flight, and as a matter of record, it is of interest to note that the officials observers on duty were as follows: At Hampstead Mr. Massac Buist, for the R.Ae.C., and Mr. Grover, for the *Daily Mail*, shared the duty of seeing that Paulhan made a proper start, while Mr. Perrin, the Secretary of the R.Ae.C., saw Mr. Grahame-White start from Wormwood Scrubbs. At Manchester the duties of observing the completion of the flight were shared by Mr. C. G. Grunhold and Mr. C. P. Glazebrook.

The Railway Arrangements.

GREAT assistance was rendered to both flyers by the London and North-Western Railway. As we mentioned last week, M. Paulhan's flight was followed by his friends in a special train, and in order to assist the aviators in picking their way past complicated crossings, the sleepers on the right line to follow were whitewashed. This was extremely helpful, while another considerate act on the part of the railway company was the removal of a number of telegraph poles at Didsbury so as to obviate any



THE GREAT LONDON-MANCHESTER FLIGHT.—Immediately after the prize was won. The crowd gathering round the Henry Farman machine immediately after Paulhan had landed at Didsbury. The white sheet in the foreground was used for marking the spot for the descent.

danger to the aviators when landing there. So interested were Mr. Frank Ree, general manager, and Mr. Robert Turnbull, superintendent of the L. & N.W. line, that they passed the night on Wednesday in a sleeping saloon placed by the landing place at Didsbury.

Titles for M. Paulhan.

AMONG the telegrams received by M. Paulhan was one from Sir Herbert Beerbohm Tree, conveying warm congratulations to the "President of the Republic of the Air"; while at the *Daily Mail* luncheon in Paris, M. Millerand, Minister of Public Works, referred to Paulhan as "Minister of Aviation."

Welcome in Paris.

THERE was an equally enthusiastic demonstration when Paulhan arrived in Paris, where he has since been fêted right royally. On Monday he was entertained at a luncheon given by the *Paris Daily Mail*, at which many of the leading French public officials were present, as well as those prominent in the flying and motor world. Later in the afternoon M. Paulhan and his wife attended a reception of the Aeronautique Club of France, while in the evening they were present at a reception given by the Automobile Club of France. Among the guests were General Brun, Minister of War, and during the evening he announced that Paulhan, who was a non-commissioned officer in the Aeronautic Pioneers, had been promoted to be sub-lieutenant of the reserve, a statement greeted with enthusiastic cheers.

At a banquet given by the French Aero Club on Tuesday evening M. Paulhan was presented with the club's gold medal. General Lafont referred to the time when Paulhan received two francs as his reward for the part he took as mechanic on board the "Ville de Paris" in her first flight to Chalons. In his speech M. Paulhan begged to be allowed to give credit for a large part of anything he had achieved to Mr. Henry Farman, whose machine he steered, M. Seguin, inventor of the Gnome motor, and M. Chauviere, maker of his propeller.

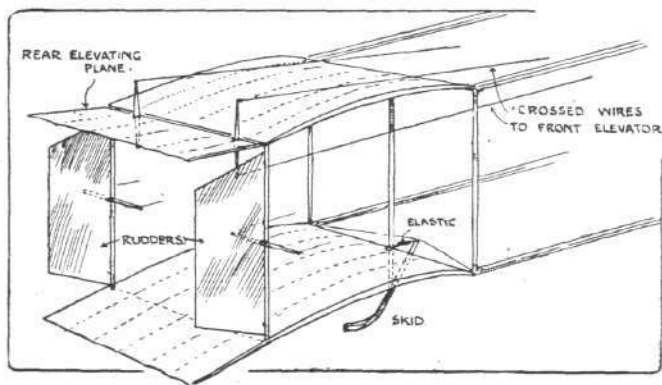
It is practically certain that before long Paulhan will be awarded the Cross of the Legion of Honour.

The Testimonial to Grahame-White.

IN consideration of the magnificent attempt made by Mr. Grahame-White to win the £10,000 prize, and as a mark of public recognition, a fund was opened by the Royal Aero Club to provide a testimonial. The wishes of Mr. Grahame-White are to devote this money to building a British machine, with which he intends to

prepared to re-start from Polesworth. Everything was ready at 5 p.m., and he rose splendidly. He had not gone far, however, before a piece of the lower tail plane became detached, and as this was impeding his flight he determined to come down close to Hade-more crossing, where his flight ended on the previous Saturday.

As the spot was 3½ miles from the Trent Valley station at Lichfield, he later flew over there to obviate the necessity of fetching a railway truck from the station.



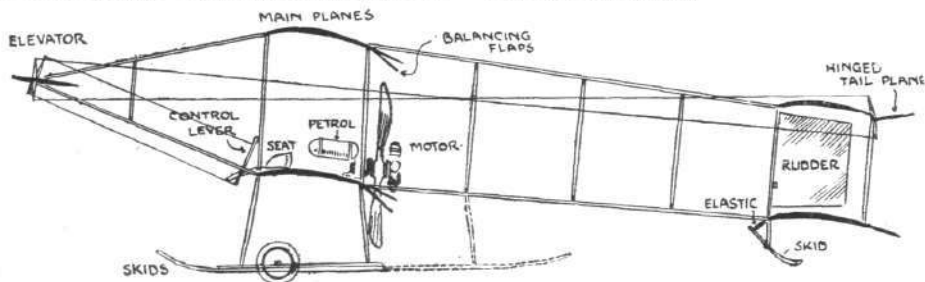
"Flight" Copyright.

TAIL OF PAULHAN'S HENRY FARMAN BIPLANE.—The main differences between Paulhan's and Grahame-White's biplanes are that in the former the lower main plane is shorter than the upper one, while twin rudders are fitted instead of a single one as in the Grahame-White machine. These twin rudders are smaller, and placed a little further back, as shown in the above sketch.

Transporting the Aeroplanes.

WHEN Paulhan's machine arrived at Folkestone, on Tuesday of last week, it was found to be too wide for the S.E. and C. Railway Co.'s lines, and so it was brought up to London by road by Messrs. Henry Johnson and Co., on a special truck towed by a lorry. It arrived at Hendon at 6.20 on Wednesday morning.

On both of Mr. Claude Grahame-White's attempts Messrs. Jos. C. Mount and Co. made arrangements to follow the flight, and to bring the machine back to London. This on each occasion was successfully accomplished, although the aeroplane was entirely unpacked and unprotected. This firm also brought the machine from France to Park Royal.



"Flight" Copyright.

GRAHAME-WHITE'S HENRY FARMAN BIPLANE.—The above sketch shows the way in which the auxiliary tail plane on Mr. Claude Grahame-White's Henry Farman machine is inter-connected by means of crossed wires with the front elevator, while the elevator is directly connected to the control lever. In this machine a skid with an elastic buffer is fitted, instead of wheels, to the tail. During a practice flight one of the long front skids was damaged, and Mr. Grahame-White had them both shortened, the part dotted in the above sketch being sawn away.

fly to Paris. Several splendid donations have already been made to this fund, headed by Sir Marcus Samuel with 1,000 guineas, as will be seen from the list on p. xiii, and further donations may be sent to the Hon. Treasurer at 166, Piccadilly, W.

Mr. Grahame-White's Last Attempt.

ALTHOUGH Mr. Grahame-White had been beaten in his flight, he determined to try and complete the distance on Thursday of last week, and when the rain ceased and the wind dropped a little he

M. Paulhan's Altitude.

DURING his flight M. Paulhan had an automatic registering aneroid barometer fitted to his machine, and this showed that both on his trip from London to Lichfield and from Lichfield to Manchester the greatest altitude reached was 400 metres, although it varied a good deal. This confirms Paulhan's statement that, in order to avoid conflicting currents, he had to vary his height very often, in order to find a more favourable wind.

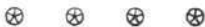
POSSIBLE AND PROBABLE CONDITIONS FOR THE NEW "DAILY MAIL" £10,000 PRIZE.

As though it were not enough in itself to put up a further £10,000 for the benefit of the flight industry, the *Daily Mail* are doubly putting everyone who is interested in the cause of progress into their debt by virtually courting suggestions as to the form that should be taken by this fresh competition. To begin with, we are glad to see that Lord Northcliffe and his associates have definitely set aside the idea which was urged upon them by some well-meaning enthusiasts that the fresh prize should only be open to British "air-men," and that in their telling leader of Wednesday last they dispel the underlying fallacy by drawing attention to the relative valuelessness of any British "win" if it only partakes of the nature of a "walk-over."

Amongst the various proposals that have been submitted for the new prize, we observe several that take into account prolonged achievements of the cross-country order, longer non-stop runs, and the carrying of one or more additional passengers. But the nearest approach that we have yet seen to the definition by proposed conditions of a real further stage in the conquest of the air is that of Professor Huntington, who urges the placing of a direct premium on automatic stability, though we are not aware that he has indicated any actual manner in which to do so while still maintaining the necessary degree of popular interest in the performance.

For our own part we feel that a definite stepping stone in the forward march of progress ought unmistakably to be signalled by the winning of this second *Daily Mail* £10,000, just as the achievement of an earlier stage has been emphasised by the London-Manchester flight. Paulhan has shown that a heavier-than-air machine can travel over a long distance in any required direction, in spite of average (even adverse) weather conditions. Controllability of a sort has therefore been proved beyond all question, though not controllability as regards variations of speed. Clearly the time has not yet arrived when anything in the nature of a race, either between competitors concurrently or against the clock, could constitute a measure of aeroplane efficiency, and indeed it would be difficult to say to-day whether the fastest or the slowest machine would deserve to win the prize.

In our opinion the *Daily Mail* proprietors might therefore do very much worse than encourage controllability as regards speed, which could easily be done by stipulating for a duplicate long-distance out and back cross-country flight, the mean horizontal speed of travel over the actual distance traversed between the two points to be at least 25 per cent. less on the one occasion than on the other, with the same machine and exactly the same equipment, and within say any period up to a week of the same date.



AIRSHIP AND BALLOON NEWS.

The "Morning Post" Airship.

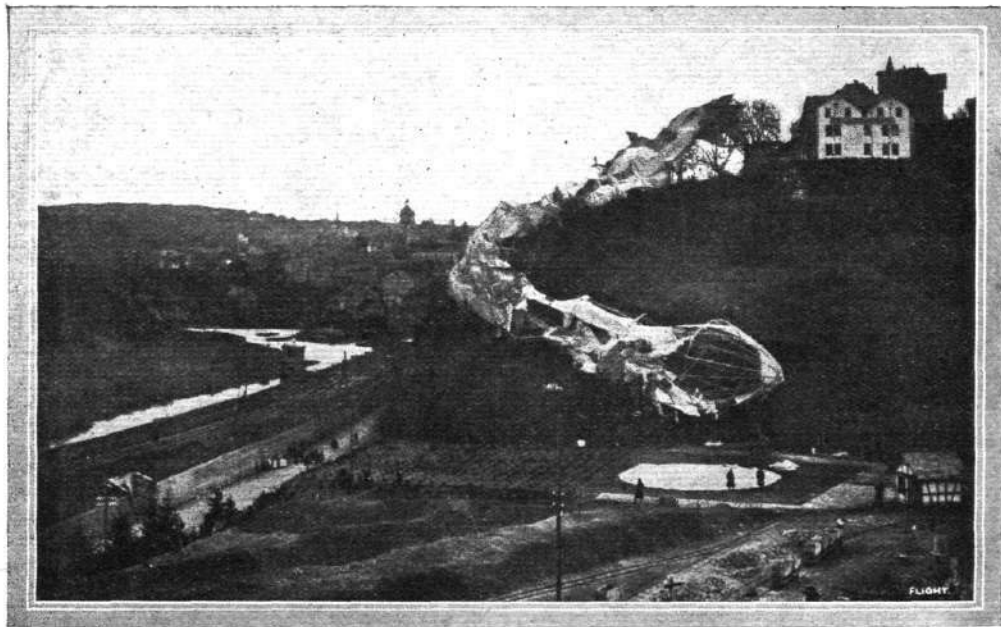
At last the work of constructing the Lebaudy airship ordered by the *Morning Post* has been completed, and on Monday the indoor trials of the machinery, &c., begun with very satisfactory results. It is hoped that the envelope will be inflated and the airship ready for her official outdoor trials during the first fortnight in June.

The dimensions of the envelope are: length 102 metres, diameter 11 metres, cubic capacity between 8,500 and 9,000 cubic

metres. It will thus be seen that it is a little larger than the Clement-Bayard airship.

Baptised with Liquid Air.

ON Saturday last, the Schutte dirigible, which resembles the Zeppelin except that the rigid framework is of wood instead of aluminium, was baptised in its shed at Rheinau in the presence of the Duke of Baden. A novel feature of the ceremony was that it was performed by the aid of a flask of liquid air, which it must be conceded was very appropriate to the occasion.



Remarkable photograph of the disaster to "Zeppelin II" on the Weberberge, illustrating the extraordinary manner in which the great airship came to grief after its mad career from Limburg, where it was torn from its human anchorage by the high wind. In the distance is seen the town of Weilburg.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 3rd inst., when there were present:—Mr. Roger W. Wallace, K.C., in the chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Prof. A. K. Huntington, Mr. V. Ker-Seymer, Mr. C. F. Pollock, Hon. C. S. Rolls, Sir Charles D. Rose, Bart., Mr. Stanley Spooner, Hon. Arthur Stanley, M.P., and Harold E. Perrin, secretary.

New Members.—The following new members were elected:—

J. Arthur Barratt.	Harry Harper.
George Brocklehurst.	William Sidney Harrison.
Capt. W. G. Townsend Currie.	F. Partridge.
J. Hoggan Ewart, M.D.	Hugh Reid.

Bournemouth Aviation Meeting.

The Royal Aero Club, in conjunction with the Royal Automobile Club, have arranged to take the Hotel Burlington, at Boscombe, for their respective members during the aviation week. It is a first-class hotel, standing in 7½ acres of ground, which extends almost to the sea. The accommodation has been taken from July 11th to 16th, inclusive. As there is a large demand for rooms, members are requested to make early application to the Secretaries of either Club.

The British Empire Michelin Cup.

The following are the rules governing this cup for the year 1910:—

The Michelin Tyre Co. has presented to the Royal Aero Club of the United Kingdom, for competition by British aviators, a trophy of the total value of £500.

Annually, for five years, a replica of this trophy, together with a sum of £500 in cash, will be given to the successful competitor. This trophy will be competed for under the following conditions, which shall apply for this year only:—

Conditions.—1. The holder of the cup for 1910 will be the competitor who, on December 31st, 1910, shall have accomplished the greatest distance on any heavier-than-air machine without touching the ground.

2. The minimum distance to be covered in order to qualify for this prize shall be 38 miles round two or more mark posts for the necessary number of circuits.

3. Entries must be made in writing to the Secretary of the Royal Aero Club, 166, Piccadilly, London, W. At least two clear days' notice must be given by a competitor before making his attempt.

4. The entrance fee of 10s. and a further sum of £1 must accompany every notification of an attempt. Competitors, however, may give notice that they will compete from day to day and in such cases must pay a deposit of £10 to cover the necessary fees for attempts on ten consecutive days, which will be returned (less expenses incurred) in respect of those days on which no attempt is made. Every competitor must be a member of some recognised body dealing with aerial matters in the Empire, and shall, if called upon, satisfy the officials of the Royal Aero Club of his ability to fly at least 500 yards, before making any attempt under these rules.

5. All attempts must be made between the hours of sunrise and sunset, in the presence of the official or officials appointed by the Committee of the Royal Aero Club.

6. The recognised flying grounds of the Royal Aero Club are at the Isle of Sheppey, but the Committee will be willing to entertain any other ground subject to the competitor paying the necessary expenses incurred.

7. The start for the records will be reckoned from the crossing over the starting line in actual flight.

8. Competitors must be British subjects from any part of the Empire, manipulating a British-made machine. All the principal parts of a competing machine must be British made. All decisions applying to this rule shall be given by the Committee of the Royal Aero Club. This shall not be held to apply to raw material, but all finished or manufactured parts of such machine must comply with the above condition.

9. The decision of the Committee of the Royal Aero Club on all matters connected with this competition to be final and without appeal.

Claude Grahame-White Testimonial Fund.

The following letter was issued to the Press and leading Clubs on April 28th last:—

The Royal Aero Club of United Kingdom.
166, Piccadilly, London, W.,
April 28th, 1910.

DEAR SIR,—It has been suggested to me by several members of the Royal Aero Club that, in consideration of the magnificent attempt made by Mr. Claude Grahame-White to win the £10,000 prize for the London to Manchester flight, some public recognition should be given to mark British appreciation of the wonderful efforts made by him. The nature of the testimonial will depend upon the amount subscribed and the wishes of Mr. Grahame-White.

Donations to be sent to the Hon. Treasurer, Royal Aero Club, 166, Piccadilly, London, W.

R. W. WALLACE,
Chairman of the Royal Aero Club.

On April 30th the further letter given below was sent out to the Press:—

The Royal Aero Club of the United Kingdom.
166, Piccadilly, London, W.,
30th April, 1910.

Claude Grahame-White Testimonial.

DEAR SIR,

Having consulted Mr. Claude Grahame-White as to his wishes for the disposal of the fund which is now being subscribed, he desires me to say that he has decided to devote the subscriptions primarily to the construction of an all-British machine, on which he intends to fly from London to Paris.

I may add that the Royal Aero Club heartily appreciates the sporting spirit which has animated Mr. White in so applying this fund.

Yours faithfully,
ROGER W. WALLACE,
Chairman.

A generous response has already been made to this fund, headed by 1,000 guineas from Sir Marcus Samuel, the total received up to Tuesday, May 3rd, 1910, being £1,484 18s. 4d.

The full list of subscribers with the amount of subscription appears on the opposite page (xiii), and further donations will be duly acknowledged next week.

Eastchurch Flying Ground.

Members visiting the flying ground at Eastchurch are requested to have with them their membership cards, as admission to the ground can only be obtained on production of same.

Members wishing to erect sheds are requested to communicate with the Secretary of the Royal Aero Club.

Railway Arrangements.—The following reduced fares have been arranged with the railway company for members visiting Eastchurch:—

1st Class return, 8s.; 2nd Class, 6s. 6d.; 3rd Class, 5s.
Tickets available for one month from date of issue.

Members desiring to avail themselves of these reduced fares are required to produce vouchers at the booking offices. Vouchers can be obtained from the Secretary of the Royal Aero Club. Trains leave Victoria, Holborn, or St. Paul's.

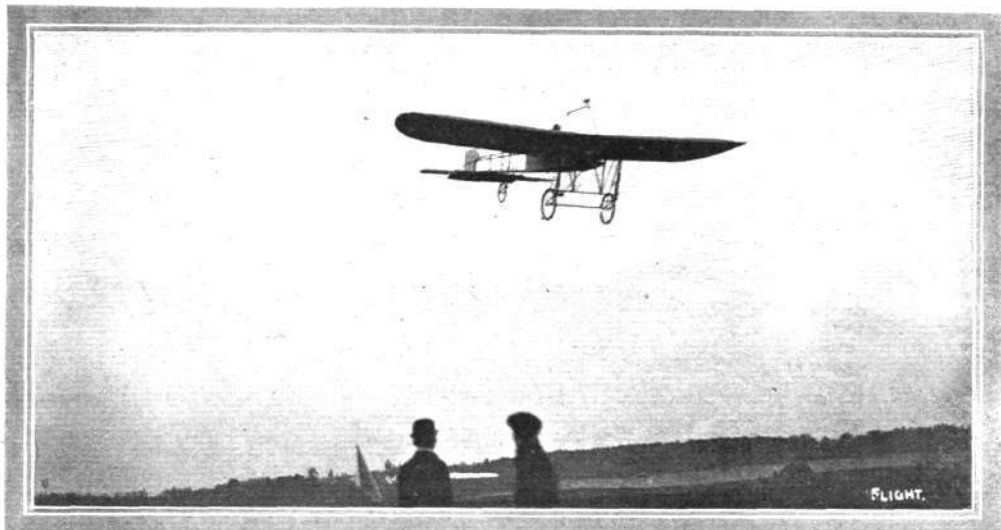
For the convenience of Members, the best train is the 9.45 a.m. from Victoria, arriving at Queenborough 10.55. At Queenborough change to the Sheppey Light Railway for Eastchurch, which is ½-mile from the flying ground.

Aviation Lantern Slides.

The Royal Aero Club have now acquired a large collection of lantern slides dealing with aviation, and members can hire these at a fee of £1 1s. for a period not exceeding three days. They include all the latest machines and pictures taken at aviation meetings in England and abroad. Application for hire should be made to the secretary.

HAROLD E. PERRIN,
166, Piccadilly. Secretary.

AVIATION NEWS OF THE WEEK.



"Flight" Copyright.

Mr. James Radley flying at Brooklands at the Spring Meeting on Wednesday last week on his Blériot machine.

Flying at Huntingdon.

THERE are now three machines of the Blériot type at the Huntingdon aerodrome, as in addition to Mr. Radley, who has made several fairly long flights lately, Capt. Dawes was out on Saturday, and made one or two short ascents, while Mr. W. R. B. Moorhouse was also testing his machine, although he did not leave the ground.

A Monoplane at Portobello.

DURING the past few days Mr. C. Hubbard has been experimenting in the Portobello Public Park with a monoplane of the Blériot type which he has built himself. On the 26th ult. he was running over the ground at a good speed when the machine canted over, and one of the wings struck the ground. As a result the plane was damaged, and the machine swerved into the fence, but the repairs will be carried out very quickly. The monoplane is driven by two twin-cylinder Rex motor cycle engines coupled up by chains to a 6 ft. tractor screw driven at 900 r.p.m.

Flying at Brooklands.

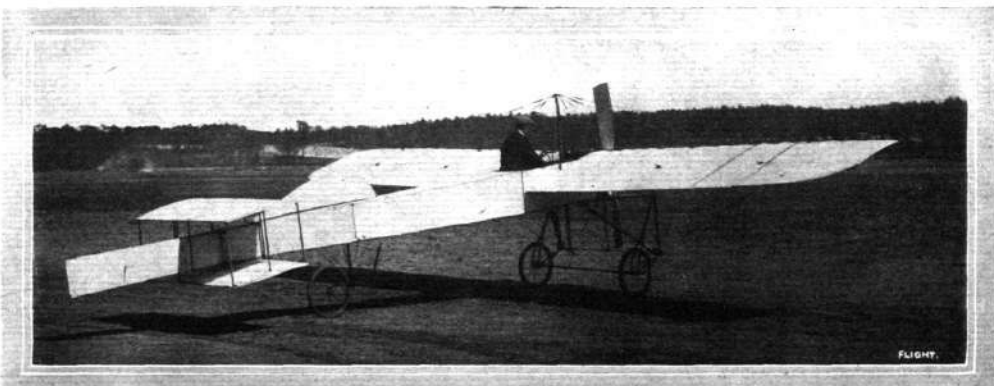
AFTER the motor car racing at Brooklands on Wednesday of last week, Mr. Radley made several splendid flights on his Blériot monoplane, and on Wednesday last Mr. D. G. Gilmour, on his monoplane, flew round the ground several times, but met with a slight accident at the conclusion of his flight.

A Biplane at Apperley Bridge.

LAST week Mr. Gaunt, the inventor of the cycloplane, took up his quarters at the Apperley Bridge aerodrome, near Bradford, with the object of testing a new biplane which he has constructed, and which has a very novel tail. This takes the form of a triangular cell, similar to the cycloplane which Mr. Gaunt showed at the first Olympia Aero Show. Twin propellers are fitted behind the main planes and driven from a two-cylinder 32-h.p. motor. Unfortunately, an accident happened on Wednesday of last week, as while the engine was being tested some petrol became ignited, and Mr. Gaunt and his assistants were severely burned, while the machine was considerably damaged. These experiments were not in any way connected with Mr. House, who has been flying a Blériot monoplane at Apperley Bridge for some time.

Proposed Aviation Meeting at Southend.

APART from the two big International meetings that are to be held in Great Britain during the present season, it looks as though one of the most important of the National meetings would be one which is being promoted at Southend-on-Sea. The chances are that it will be held some time in September, though the date is not as yet definitely fixed, and it is hoped that many of the



Mr. J. V. Neale's new monoplane with which he is at present practising at Brooklands.

very best known aviators will take part in it. The situation of Southend, within flying distance of the Royal Aero Club's grounds across the river, to say nothing of its close proximity to the Metropolis, is bound, weather permitting, to assure success to the undertaking, since not only are the leading municipal officials down there associating themselves with it, but the close association between them and the City of London is sure to have its beneficial influence. A small company is now being formed for meeting the inevitable expenses and for assuring the convenience and comfort of everyone concerned, while we understand that Mr. George Neill has arranged to act as General Manager in conjunction with a strong Board of Directors. The site for the aerodrome is, it is claimed, particularly suitable for an aviation meeting of this character.

Mr. Farman's Monoplane Now Ready.

SOME time ago we referred to the fact that Mr. Henry Farman had determined to experiment with a monoplane, and had commenced the construction of one. While London and Paris have been fêteing his pupil, Paulhan, Mr. Farman has been putting the finishing touches to his machine, and by the time these lines are in print it is probable that the first trials will have been made. The monoplane differs in many respects from others of this type, notably in the fact that the pilot sits under the wings, with the Gnome motor behind him. It is confidently expected that it will be a great success.

Farman Brothers Fly Together.

ON the last day of April, Mr. Henry Farman paid a visit to his brother Maurice at Buc, and while there enjoyed the sensation of being taken for a trip in the new Maurice Farman biplane. Several of those who saw the two brothers seated one behind the other, recalled the time, some fifteen years ago, when they occupied similar positions, although their mount then was a tandem bicycle on which they managed to secure many valuable prizes.

Maurice Farman at Buc.

MR. MAURICE FARMAN is preparing for a passenger flight from Buc to Orleans, and on the 28th made a cross-country flight of 30 kiloms, carrying M. Tabuteau as passenger. During the trip he passed over Villerois, Voisin, Trappes, circling round the clock tower there, Toussus-le-Noble, Chateaufort and Saclay. On the previous day he took several passengers for trips, including his father, Mme. Tabuteau and Marquis Vivaldinir.

Doings at Mourmelon.

The Farman School.—Lieut. Cammerman commenced the training of five new military pupils on the 26th ult., and on the following day Lieut. Fequent flew for 1 hr. 7 mins., his average height being 100 metres. Lieut. Sidot made several circuits of the ground as also did Lebedeff, who was flying alone for the first time, Cheuret, a new instructor, flew with several pupils, being in the air altogether for about six hours, while on the 28th he made a splendid flight, taking a passenger for a trip lasting 1 hr. 32 mins. On Friday last Lieut. Fequent carried out the necessary qualifying flights for his pilot's certificate, and M. Mahieu, one of the directors of the new Farman aerodrome at Beauce, flew for 4 kiloms. On

Monday, Nicholas Kinet took his brother for a 20 mins. jaunt, while a similar flight was made by Lieut. Fequent, who, in a second trial, rose to a height of 250 ft., from which he planed down with motor stopped.

The Antoinette School.—Two flights of 20 mins. each were made by Wachter when testing new machines on the 26th ult., and on the next day one of his pupils, Labouchere, flew 2 kiloms., including turning, and this he repeated on the 29th. The same day Wachter went up in a new machine, and passed over the country at a height of 100 metres for 56 mins.

The Blériot School.—René Barrier successfully made the three flights to secure his pilot's certificate on April 28th, and Siman and Aubert also made several good trials, while several other pupils, including two ladies, Madame Herven and Madame Miel, were given lessons. On Monday, at his second attempt, Ehrmann flew for half a circuit of the camp, and later made a fine straight-line flight.

Koechlin at Mourmelon.

SEVERAL good flights have been made by Koechlin on his monoplane at Mourmelon, although none of them have been of any very great length.

Doings at Pau.

SEVERAL of the pupils at the Blériot school have been busy practising on their machines during the past few days, and MM. Blériot and Leblanc have been busy conducting experiments with a two-seated monoplane, built on the lines of the cross-Channel type. With this a flight of 40 kiloms. was made on the 28th ult. Leblanc carried out several trials on Sunday last, and landed at the end of one in a gliding flight from a height of 60 metres.

M. Paulhan after Clermont-Ferrand Prize.

HAVING landed the London to Manchester prize, Paulhan, in conjunction with Mr. Henry Farman, may possibly, before long, try to win the £4,000 prize offered by M. Michelin for the first man to fly with a passenger from Paris to Clermont-Ferrand and land on top of the Puy du Dome, which is 1,456 metres high.

A Speed Record.

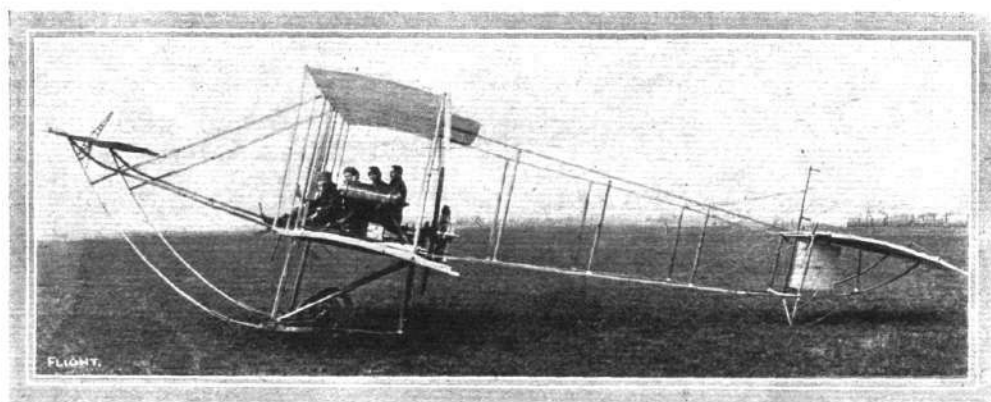
AT their last meeting the Commission Aérienne-Mixte passed the speed record of 3 mins. 57 secs. for 5 kiloms. made by Jacques Balsan on his Blériot monoplane at the recent Heliopolis meeting.

Opening of the New Henry Farman School.

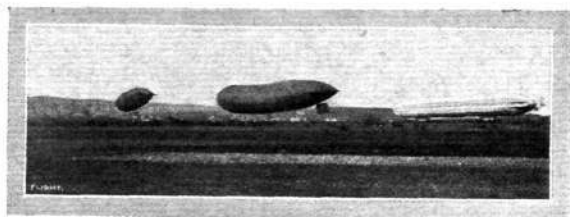
THE official opening of the new Henry Farman aerodrome and flying school at Beauce, near Etampes, has been fixed for to-morrow, Sunday, when it is probable that, besides flying by many of the pupils, Mr. Henry Farman will attempt to better some of the world's records at present held by his machine, and possibly use his monoplane publicly for the first time.

A New Blériot School.

WITHIN about five kiloms. of Etampes and close to the new Farman aerodrome, M. L. Blériot has acquired a large tract of land



FOUR IN AN AEROPLANE.—Mons. Sommer on his "Sommer biplane upon the occasion when he carried three passengers, including Mdlle. Dutrieux, in addition to himself, for a flight. It will be remembered we gave the particulars of this flight in last week's issue, the weight of the machine complete with its passengers totalling to no less than 1,060 lbs.



The parade of dirigibles before the German Emperor in Homburg last week.

for the purpose of starting another school. The ground is part of the Arbouville farm, near Angerville, and lies between the Orleans main road and the Paris-Orleans railway.

Count Lambert Flies with Miss Roosevelt.

A NUMBER of distinguished visitors last week inspected the French Wright works at Villacoublay, and after Count Lambert had given the usual lessons to the pupils, he took Miss Ethel and Mr. Kermit Roosevelt for short trips in the air on a new type of Wright flyer. Miss Roosevelt declared the experience to have been adorable, and only regretted that her trip was so short. Afterwards Count Lambert took Signor Gabriele d'Annunzio for a short flight.

Frey at Poitiers.

HAVING obtained delivery of his Sommer biplane, M. Frey conveyed it to Poitiers, and on the 29th ult. made three flights of 10 mins. each with a passenger. These performances were repeated the next day, but on landing from the last trip one of the skids was slightly damaged.

The Sommer School at Moulon.

ON the 28th Bouvier made a splendid flight, lasting an hour, during which he carried a passenger, and on the following day Sommer was trying a new machine, and carried the Hon. C. S. Rolls as a passenger during one trip, rising to a height from which he descended *en vol plane*. On Wednesday, Bouvier, accompanied by Mdle. Durieux, left for a tour of Russia, having arranged to give exhibition flights in Odessa, Kiev, Moscow, and Warsaw.

Gabriel to Become an Aviator.

FINDING his old occupation more or less gone, Gabriel, the one-time driver of Mors racing cars, has betaken himself to Mourmelon, in order to familiarise himself with the Voisin biplane, with which he hopes to become as expert as he was with speedy cars.

Efimoff at Nice.

BEFORE packing up his biplane at Nice on the 26th ult., that prince of daring aviators, Efimoff, made several short flights with passengers, and among others he took the Princess Narischkine for a brief excursion into the central blue.

Second Lanz Prize Won.

ON the evening of the 29th ult., at Johannisthal, Herr Behrend succeeded in covering a distance of 2½ kiloms. in the form of a figure eight, and thus secured the second Lanz prize of 7,000 marks.

An Austrian Flyer.

AT Lemburg, on the 29th ult., Pierre Grand, on the aeroplane designed and built by engineer Moskowsky, succeeded in flying for the second time a distance of 10 kiloms., at a height of 80 metres, from which he landed with a gliding flight. He made his first flight on the 26th.

Greene Biplane Flies.

SOME very satisfactory tests were made on April 1st, at Mineola, Long Island, with the Greene biplane, which is very similar to the Farman machine except that there are four panels between the main planes. At the first attempt the machine flew for a mile and a half from Mineola to the Parkway, and later a circular flight of 2 miles was carried out. Then Dr. Greene gave his place to the purchaser, Mr. R. W. Crosby, who, after flying the machine for a mile and a half, had it packed up for transport to San Francisco.

The Tours Meeting.

A FLYING meeting commenced at Tours on Saturday last. Duray was the first in the air, but he only flew a short distance, and the honours of the day rested with Capt. Dickson and his Henry Farman machine, which covered 16 kiloms. in 17 mins. 47½ secs. Kuller, on an Antoinette, was also up for a distance of 10 kiloms., and Chavez, on a Henry Farman, just under four kiloms. On Sunday the strong winds did not permit much sport, but Capt. Dickson managed to get 32 kiloms. to his credit, good flights also being made by Metrot, on his Voisin, Kuller and Chavez. Kuller secured the speed prize by covering 4 kiloms. in 3 mins. 58½ secs. Although the wind moderated on Monday, it was succeeded by a steady downpour of rain, but, in spite of this, six aviators were in the air. Capt. Dickson made the best performance of the day by flying 45.74 kiloms., while Metrot was second with 33.74 kiloms. Molon, on a Blériot, made several flights, the longest of 14 kiloms., and during the day covered in all 52 kiloms. The speed prize was won by Duray, who was timed over the 4 kiloms. in 3 mins. 49½ secs.

Boy Scouts and Balloon Despatches.

A SERIES of experiments were made on Saturday by the Aerial League and the Scouts' Association, with a view to testing the value of boy scouts as despatch runners and for signalling to balloons. Two balloons, piloted by the Hon. C. S. Rolls and Major Baden-Powell, and carrying officials of the Aerial League, ascended from Battersea gasworks at 3 o'clock. From time to time various despatches were dropped overboard, and these had to be delivered at the Aerial League headquarters. Up to the time of closing the headquarters on Saturday night over twenty messages had been sent in, and the bronze medal for the first one home went to Sergeant Sydney Mastin, of Beckenham, while the special medal for general smartness for dealing with a despatch was secured by Corporal Woollacott, of Wandsworth. The balloon "Continental," piloted by Major Baden-Powell, descended at Tonbridge, in Kent, while the balloon, in charge of the Hon. C. S. Rolls, came down about a mile further away.

Petrol from Sarawak.

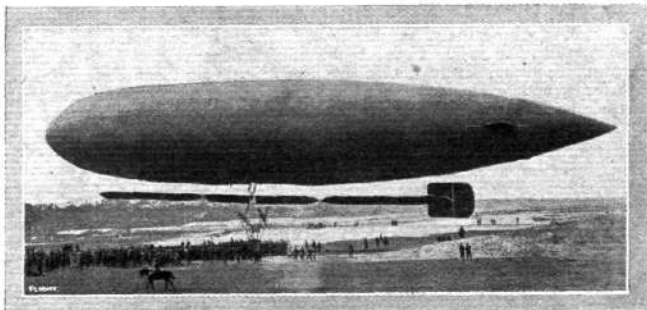
AVIATORS and motorists who may have had any qualms as to the supply of petrol running out, will be re-assured on hearing that the British Petroleum Co., the owners of the famous "Shell" fuel, have just discovered unlimited supplies of oil in Sarawak, British North Borneo. Since Sir Marcus Samuel first introduced the policy of transporting petroleum in bulk, and developed the oil fields of Borneo, his firm have gone steadily forward, and this new discovery should further add to their magnificent prosperity.

Models at South Kensington.

A NOTABLE addition to the exhibits in the Southern Gallery at the Victoria and Albert Museum, South Kensington, is a one-tenth scale model of the cross-channel Blériot monoplane made by Messrs. T. W. K. Clarke and Co. to the order of the Museum authorities. This model is exact in almost every detail, and the working drawings for it were approved by M. Louis Blériot himself.

Alvaston Motors in London.

WITH reference to the description in our last issue of the Alvaston flight motors, we learn from the Aeroplane Supply Co., who are the London agents, that they have duplicates of this engine, fitted with Asco propellers, on view at their Piccadilly showrooms.



The new German military dirigible, "M3" (Gross-Basenach system).

CORRESPONDENCE.

*. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents asking questions relating to articles which they have read in FLIGHT, would much facilitate our work of reference by giving the number of the letter.

NOTE.—Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.

AERONAUTICS FOR THE NAVY.

[495] Your correspondent, Mr. Charles C. Turner, must be a thought-reader to be able to inform your readers that I do not consider man-lifting kites a part of a warship's equipment, for I have never said this in print, and have no recollection of having expressed such an opinion verbally. I therefore suspect my sin to be one of omission. I was not aware that one of our battleships is still experimenting in this direction, although I was aware that they were making experiments with towing kites at sea some eight years ago. As, however, my informant shows that the Navy are still in the experimental stage after eight years' experience of towing kites, my omission to advocate this method of observation seems a reasonable omission. My suggestion was for the naval authorities to accord to the captive balloon the benefit of the same tests they accorded to the kites, because I believe they would find the small hydrogen balloon the best means of obtaining useful observations. I am led to the above conclusions by my own experience in the management of kites and captive balloons from boats and yachts, and it is quite possible I may prove to be wrong in tests carried out on a larger scale. I should be very glad if Mr. Turner would say what his experience has been in towing kites such as he advocates, because he might be able to help me with the kites afloat, and I should be only too glad to endeavour to remove some of the difficulties he has evidently experienced with captive balloons.

GRIFFITH BREWER.

GLIDERS.

[496] I notice the letter upon the above subject from your correspondent, Mr. W. W. Smith, from a little experience may I offer the following suggestions which may be of assistance to him.

In my opinion an area of 252 sq. ft. is not quite sufficient to support with comfort his weight, 150 lbs., and that of the machine, say another 50 lbs.—a total of at least 200 lbs. The area of the main-planes only should be about $\frac{1}{2}$ lb. to the sq. ft., or, say, an area of 300 sq. ft. The efficiency of his machine as a glider is reduced by the somewhat low aspect ratio of 5'14. The bamboo spar suggested might be strong enough with a large number of wire stays, but the use of so light a spar is not advisable for monoplane construction.

Mr. Smith would be very much better advised in constructing his machine to the biplane type with a span of something over 30 ft., and a chord of 5 ft. to each main-plane.

An elevator and rudder are essential for proper control, but a tail is of doubtful advantage, and if fitted should be of the lightest construction possible.

With a launching system such as Wright's, gliding may be enjoyed on practically a calm day, otherwise a suitable wind of about 15 m.p.h. or over would be necessary for launching, and I have found waiting for wind a very tedious business.

I may mention that I have approaching completion a biplane-controlled glider with a wing spread of 330 sq. ft., which I should be pleased to show to Mr. Smith if he is interested and is anywhere within reach of Surrey, near London.

I really think that gliding flight is well worth following up as a sport, with the greater part of the fascination of flying at a tithe of the expense, nothing, in fact, beyond the initial outlay upon the machine, if we can only get enough enterprising people to set to work and favour us with records of their experiences.

Sutton.

HORACE W. H. VAUGHAN.

INSURANCE.

[497] Some weeks back you referred in an article to an insurance policy against third party claims. I am negotiating for the use of a private ground, surrounded by grazing land and allotments, situated some 200 yards from a main road which is frequented at week-ends by many holiday makers. Doubtless many of them will be attracted by my efforts, and I should be very much obliged if you would let me know if I could be held responsible for any damage done by them to the adjoining owner's hedges, crops or cattle.

It seems to me that the owner's remedy is against the trespassers, though, as this process would hardly bring in much by way of compensation, they might be inclined to go for me for attracting the crowd.

Probably some of your readers have had experience of this sort of thing when making an impromptu landing on private grounds, and could give me some advice.

AVIATOR.

A BRITISH-BUILT MONOPLANE.

[498] I am sending you some particulars of my monoplane.

I have been studying aviation since August, 1908, and have been through the various stages, with models, making experiments with wing-flapping machines; also building monoplanes with bamboo framing, but do not consider that bamboo makes a nice-looking job, as it is difficult to make clips to look very neat.

My latest machine has a spread of 35 ft. and chord 6 ft. 1 in., length 22 ft. over all. Tail elevators of a special shape; 30 sq. ft. area; rudder 6 sq. ft.

Lateral stability is secured by ailerons 18 sq. ft. each, and controlled by hand lever, right hand, or can be worked by moving one's knees. A left hand lever works elevator, and foot levers work the rudder.

The shock absorption is taken by pneumatic sprung wheels, tested to 10 cwt. pressure, and then the skids take the weight.

The framework is of special grained pitch-pine, very light and very strong, every spar you can follow the grain from one end to the other. Our firm being in the timber trade and also wireworkers, building aeroplanes comes quite naturally. No wire tighteners are used on the machine at all, and every wire is drum tight. A special



Mr. F. Day's cleverly-designed monoplane.

way of tightening them has been devised, and, naturally, a considerable saving in expense. The covering material of the planes is Spencer's aeroplane fabric, which I may say works very well, as we were able to fix it on without a crease, and very tight. First the fabric was all sewn together, and then drawn over the planes and fastened off at the trailing edge. Split canes were used for tacking fabric to ribs, and makes a very neat job. Also in case of damage to planes it will be easy to remove for repairs. The War Office have granted to us the use of a large flat field, over a mile square, and I have built a hangar there to house the machine.

The total weight of monoplane as now, without motor, is 320 lbs.

Also I have got some very good results from a 6 ft. laminated steel tractor screw which I have made. It was tried on shafting at 500 r.p.m. at 14-h.p., and gave a thrust of 135 lbs., and weighs 16 lbs. I seem to fancy a steel propeller instead of a wooden one, as it ought to have a good fly-wheel effect, and make the engine run steady.

The machine is made shorter than usual, because every bird has a greater spread than length, and when going backward and forwards to Gosport to the hangar I have been very carefully watching seagulls.

You can judge of the amount of work in the planes, for there are 620 pieces in the two.

The monoplane has a good lifting surface, as when it was out in the open, having its photo taken, in a slight wind head on, it took

three of us to hold it down steady, and once when we let it go it rose by itself about one foot off the ground. Every spar in the machine can be replaced in case of breakage, special means being taken in building to enable it.

If any of your readers would care to take a financial interest to help purchase the engine, I shall be pleased to hear from them.

Portsmouth.

F. DAY.

TRANSPORTING FLYERS.

[499] We notice in your issue of April 23rd a letter re transporting flyers, in which Messrs. French make a special feature of the small wooden platform on wheels fitted with pneumatic tyres, on which the packing case is carried.

We would, however, like to point out that there is nothing new in the idea. It has been in vogue for a considerable time for transporting machines unpacked round the marshes about Shellbeach, and was used to bring Mr. Moore-Brabazon's machine to Olympia unpacked, and it was taken back the same way. For the smaller Blériot type machines this method is not at all satisfactory. We have special low trollies 24 ft. long for this work, and have handled dozens in this way during the last two years. We, too, have made a speciality of carrying aeroplanes from and to the various flying meetings ever since they first began to travel about.

4, Brabant Court, Philpot Lane.

JOSEPH C. MOUNT.

[500] Our attention has been called to the illustration in your paper representing the despatch of an aeroplane from Olympia, this being mounted on a special platform, and drawn by motor lorry.

Will you kindly note that the contract for the conveyance of this aeroplane was given to us by the Aero Club, for whom we do considerable business in this direction, and it was in consequence of our having undertaken the despatch of these machines all over the country that we arranged with Messrs. French to have a special platform built, and to do the necessary haulage whenever we were able to place the contract in their hands. We give Messrs. French, as far as possible, such business in view of the fact that we desire to reciprocate the shipping business which the Ryknield Motor Co. (for whom Mr. French is agent) entrust to our care.

We shall be glad if you will kindly note this in your paper, and much oblige

HENRY JOHNSON, SONS AND CO., LTD.

MONOPLANE V. MULTIPLANE.

[501] In connection with the relative advantages of monoplanes and multiplanes, I should be glad to have your opinion as to whether a monoplane has greater, equal, or less supporting power than a biplane, if the angles of incidence and deflection are equal, the dihedral angle of the monoplane is 180, the span and the camber coefficient is the same in the monoplane as in both surfaces of the biplane, and the chord of the monoplane is twice that of the biplane.

MECHOS.

[According to the above specification, the chord of the monoplane is to be twice that of the biplane; the areas will, therefore, be equal for equal spans. The aspect ratios will similarly be inversely proportional to the chords, e.g., if the aspect ratio is 6 in the biplane it will be 3 in the monoplane, which would tend to make the monoplane the least efficient machine under the above conditions.—ED.]

DIHEDRAL ANGLE.

[502] Being much interested in Mr. Flight's letter, No. 410, on the above subject, I should be glad of a little further space in which to reply to the points he raises.

With regard to his plane, AB, it is clear that the total pressure (if other conditions do not change), depends upon its length. But when such a plane (either singly or forming one member of a dihedral couple) tilts, its length does not alter, and, therefore, the total pressure upon it remains constant. This must surely be admitted. What does change, however, is the *direction* of the pressure in space, as it is always normal to the plane. Mr. Flight speaks of the "effective length," by which I take it he means the projected length on the horizontal. It is quite true that this alters when the plane tilts from the horizontal, and that, therefore, the vertical component decreases. Were we to consider these vertical components alone, there would be a righting couple tending to restore a dihedral-angled plane to the horizontal. But if we take into account the horizontal components as well, we find an opposing couple which exactly balances that of the vertical forces, and causes the resultant force to still pass through the c.g.

I have attempted to show this in Figs. 1 and 2, though the previous diagram given by Mr. Olley is clearer, as it treats of total forces only. In Fig. 1, the aeroplane is on "even keel."

P_1 and P_2 are the total pressures on the planes, and act at A and B. V_1 and V_2 are the vertical components. H_1 and H_2 are the horizontal components. The resultant of these four components is evidently $(V_1 + V_2)$ acting at C, midway between A and B. (H_1 and H_2 neutralise one another and only cause a stress in the bracing of the planes.) In Fig. 2 we assume that the lateral balance has just been disturbed, and the machine is still travelling in a straight line. V_2 is now greater than V_1 and, if we stop our

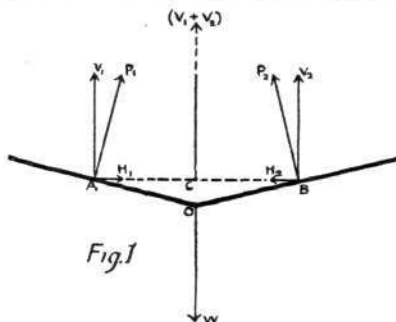


Fig. 1

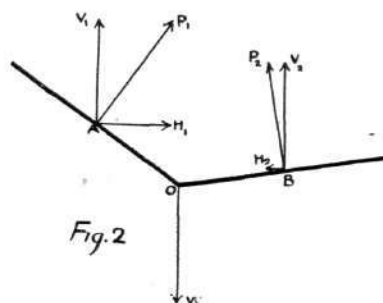


Fig. 2

argument at this point, we shall conclude that a counter-clockwise righting couple is applied. But H_1 is now out of line with H_2 , and is also greater than H_2 . The net effect of this is to (1) apply a couple in a clockwise direction, and (2) apply a horizontal force equal to $(H_1 - H_2)$ urging the machine sideways.

Taking all these forces into account, it is easy to show that the total righting couple is zero, and the resultant force one which urges the machine sideways and downwards. This force is the force, O, F, in Mr. Olley's diagram. Until the aeroplane has accelerated in this new direction, however, there is clearly no tendency for it to right itself. I regret the length of this letter, but I have tried to show in detail why it is incorrect to show vertical forces only. May I point out that in Mr. Flight's Fig. 3, the total pressure is still the same as in Fig. 1, except that it is all horizontal instead of all vertical. I assume, of course, that the angle between the plane and its direction of flight remains the same.

Rugby.

R. C. CLINKER.

MODELS.

MODELS, QUESTIONS, AND TIPS.

[503] Re Letter No. 431, by Messrs. R. and L. Richards, I should be much obliged if the authors would let me know following points concerning their model Blériot:—

(a) How much elastic, and of what calibre, they use to make models rise from ground?

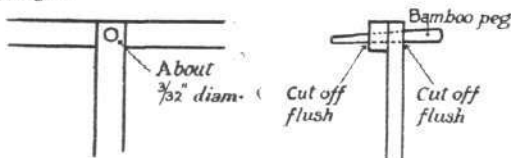
(b) Where centre of gravity is situated?

I have made a model Blériot $\frac{1}{16}$ scale, and the total weight of machine with propeller (minus elastic) is just under 3 ozs. I have tried a geared elastic motor (1 to 6) with 12 yards of $\frac{1}{16}$ in. rubber, but machine failed to rise from ground. I have also tried 6 yards $\frac{1}{16}$ in. rubber direct drive on to propeller with same result. The centre of gravity of my machine is about 1 in. backwards from trailing edge of wings; is this too far back? I have always understood that c.g. should be $\frac{1}{3}$ chord from entering edge. Wings are made of cane and jap silk varnished, and whole machine, though so very light, has stood a vast deal of knocking about.

A "tip" which may be useful to model makers is as follows:—Joints can be made exceedingly strong and light by means of bamboo

pegs. Use pegs about $\frac{3}{16}$ in. diam. made out of outer part of bamboo, and glue well into place.

I have built four models now, and I find the above joint by far the lightest and strongest—usually the spars will snap before the joint goes.



Best wishes to FLIGHT. I note it has been steadily improving ever since No. 1 appeared.
Wrexham.

C. T. NESBITT, A.R.S.M.

A QUESTION OF WEIGHT AND MOTOR.

[504] I have built a model monoplane of 5 ft. span, with a total lifting surface of $6\frac{1}{2}$ sq. ft., weight $1\frac{1}{2}$ lbs. Could you or any of your readers tell me the weight this model will carry to fly well? Could I use an electric motor? If so, where obtainable?

Hillhead.

J. WATSON.

ELASTIC MOTOR.

[505] I think it would be very interesting to know the record thrust for weight of a rubber motor. Number of revolutions to be not less than 150.

I wonder who can beat this. I have a motor 24 ins. long, giving 150 revolutions, weighing complete with propeller 5 ozs., that gives a thrust of 8 ozs. Hoping you can find room to insert this in the columns of your excellent paper.

Balham, S.W.

S. FAULKNER.

A Dirigible in a Music Hall.

THERE is no accounting for popular taste in the matter of public entertainment, but we must confess one would scarcely expect to witness the spectacle of a fairly big model dirigible sailing about the auditorium of the London Hippodrome, where at the moment it constitutes one of the star turns. The dirigible in question is fitted up with wireless control, and the operator, Mr. Raymond Phillips, makes it travel where he will, more or less, by the diligent rapping of an electric key on the stage. There is much crackling of electrical discharge, followed by the setting in motion of one or other of the various propellers with which the car of the dirigible is equipped. Two propellers on a pivoted cross-beam control the direction, while other two mounted on vertical shafts control the altitude. The little electric motors that drive the propellers obtain their energy from a small battery of cells, which are switched into action by a device that is sensitive to the wireless electric waves.

As an indication of a phase of aeronautics that is quite likely, indeed, we may as well say quite certain, to figure in the future, this display at the Hippodrome is a thoroughly interesting and instructive turn, and brings before many hundreds of people a visual demonstration of a scientific subject that in the ordinary course of events they would only be likely to read about at the best. The mere fact that they have seen a model dirigible controlled without wires will enable them to take a little more personal interest in the real thing when it comes, and if this sort of show proves popular for any length of time we shall really become quite an intellectual race.

Aeronautical Patents Published.

Applied for in 1909.

Published April 28th, 1910.

8,531. S. L. WALKDEN. Aeroplanes.

Published May 5th, 1910.

8,602. G. STEVENSON. Flying machines.

8,687. L. B. GOLDMAN. Aerial machines.

14,365. A. HENRY. Aeroplanes.

15,542. C. J. BELLAMY. Airship.

22,124. H. MOYA. Aerial vessels.

22,263. F. ARENS. Dirigible balloons.

NEW COMPANIES REGISTERED.

International Aero Co., Ltd.—Capital £1,000, in £1 shares.
Midland Aero Club, Ltd., 34, Waterloo Street, Birmingham.
—Capital £1,000, in 15 shares.

DIARY OF FORTHCOMING EVENTS.

British Events.

1910.		1910.	
May 7	Model Competition. Kite and Model Aeroplane Assoc.	June 25-July 2	Wolverhampton.
May 10	"Points on Construction and Design." Mr. T. W. K. Clarke. Aero Models Assoc.	July 2	Balloon Race, Hurlingham.
May 14-21	Huntingdon.	July 16	Kite and Models Competition. Kite and Model Aeroplane Assoc.
May 28	Balloon Race, Hurlingham.	July 11-17	Bournemouth.*
June 4	Kite and Glider Contests. Kite and Model Aeroplane Assoc.	July 23	Balloon Race, Hurlingham.
June 4-11	Doncaster.	July 28-Aug. 3	Lancashire.
		Aug. 6-13	Lanark.*
		Aug. 15-20	Lancashire.

Foreign Events.

1910.		1910.	
May 1-8	Seville.	July 24-Aug. 10	Belgium.
May 10-16	Berlin.	Aug. 25-Sept. 4	Deauville.
May 14-22	Lyons.	Sept. 8-18	Bordeaux.
May 15-22	St. Petersburg.	Sept. 24-Oct. 3	Milan.
May 17	Palermo.	Oct. 18-25	St. Louis. Gordon-Bennett Balloon Race.
May 20-30	Verona.	Oct. 25-Nov. 2	America. Gordon-Bennett Aeroplane Race.
June 5-12	Vichy.		
June 5-15	Budapest.		
June 26-July 10	Rheims.*		

* International.

BACK NUMBERS OF "FLIGHT."

SEVERAL back numbers are now very scarce, and have been raised in price as follows:—

No.	Date	Containing	Table of Propellers ...	s. d.
No. 2,	Jan. 9,	9, containing	Table of Propellers ...	1 6
6,	Feb. 6	"	"How Men Fly" ...	1 0
8	" 20	"	Aeronautical Bibliography.	
10,	Mar. 6	"	Wright Bros.' Elevator Patents.	
12	" 20	"	Flying Ground at Farnbridge	1 0
15,	Apr. 10	"	Illustrated Glossary.	
16	" 17	"	Human Side of Flying ...	1 0
31,	July 31	"	Aero Club Ground at Shellbeach.	
		"	Military Aeronautics.	
		"	Souvenir Supplement	1 6
		"	Engines at Olympia ...	1 0
		"	Prize List ...	3 6
		"	Models at Olympia.	
		"	Blériot Flyer ...	2 0

(Full page drawing.)

Other back numbers (excepting Nos. 3 and 4, which are out of print), post free, $1\frac{1}{2}$ d. each, including descriptions and scale drawings of the Voisin (Nos. 33 and 34), Curtiss (No. 27), Cody (No. 27), Farman (No. 42), and Wright (No. 63) biplanes, the Santos Dumont (Nos. 40 and 41), Antoinette (Nos. 43 and 44), and Grade (No. 50) monoplanes, and of a full-size Wright glider (Nos. 38 and 39).

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